

## SEQUENCE LISTING

<110> MASTROIANNI, NADIA  
CAINARCA, SILVIA  
CORAZZA, SABRINA

<120> PHOTOPROTEINS WITH ENHANCED BIOLUMINESCENCE AND ASSAYS  
USING THE SAME

<130> 100506-00028

<140> 10/587,523

<141> 2006-03-09

<150> 05005390.9

<151> 2005-11-03

<150> 06000171.6

<151> 2006-05-01

<160> 24

<170> PatentIn Ver. 3.3

<210> 1

<211> 198

<212> PRT

<213> Clytia gregaria

<400> 1

Met	Ala	Asp	Thr	Ala	Ser	Lys	Tyr	Ala	Val	Lys	Leu	Arg	Pro	Asn	Phe
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Asp	Asn	Pro	Lys	Trp	Val	Asn	Arg	His	Lys	Phe	Met	Phe	Asn	Phe	Leu
			20					25					30		

Asp	Ile	Asn	Gly	Asp	Gly	Lys	Ile	Thr	Leu	Asp	Glu	Ile	Val	Ser	Lys
		35				40						45			

Ala	Ser	Asp	Asp	Ile	Cys	Ala	Lys	Leu	Gly	Ala	Thr	Pro	Glu	Gln	Thr
	50					55					60				

Lys	Arg	His	Gln	Asp	Ala	Val	Glu	Ala	Phe	Phe	Lys	Lys	Ile	Gly	Met
	65				70					75					80

Asp	Tyr	Gly	Lys	Glu	Val	Glu	Phe	Pro	Ala	Phe	Val	Asp	Gly	Trp	Lys
			85						90					95	

Glu	Leu	Ala	Asn	Tyr	Asp	Leu	Lys	Leu	Trp	Ser	Gln	Asn	Lys	Lys	Ser
			100					105					110		

Leu	Ile	Arg	Asp	Trp	Gly	Glu	Ala	Val	Phe	Asp	Ile	Phe	Asp	Lys	Asp
			115				120						125		

Gly	Ser	Gly	Ser	Ile	Ser	Leu	Asp	Glu	Trp	Lys	Ala	Tyr	Gly	Arg	Ile
						130				135				140	

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
180 185 190

Tyr Gly Asn Phe Val Pro  
195

<210> 2

<211> 198

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
protein construct

<400> 2

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
35 40 45

Ala Ser Asp Asp Ile Ser Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
180 185 190

Tyr Gly Asn Phe Val Pro  
195

<210> 3  
<211> 198  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
protein construct

<400> 3  
Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
1 5 10 15  
Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
20 25 30  
Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
35 40 45  
Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
50 55 60  
Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
65 70 75 80  
Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
85 90 95  
Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
100 105 110  
Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
115 120 125  
Gly Ser Gly Cys Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
130 135 140  
Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
145 150 155 160  
Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
165 170 175  
Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
180 185 190  
Tyr Gly Asn Phe Val Pro  
195

<210> 4  
 <211> 198  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 protein construct

<400> 4  
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 Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
                   20                  25                  30  
 Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Arg  
           35                  40                  45  
 Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
           50                  55                  60  
 Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
           65                  70                  75                  80  
 Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
                   85                  90                  95  
 Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
           100                  105                  110  
 Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
           115                  120                  125  
 Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
           130                  135                  140  
 Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
           145                  150                  155                  160  
 Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
                   165                  170                  175  
 Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
           180                  185                  190  
 Tyr Gly Asp Phe Val Pro  
           195

<210> 5  
 <211> 198  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 protein construct

&lt;400&gt; 5

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Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
 1           5           10           15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
      20           25           30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys
      35           40           45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr
      50           55           60

Lys Arg His Arg Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
      65           70           75           80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Val Phe Val Asp Gly Trp Lys
      85           90           95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
      100          105          110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
      115          120          125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
      130          135          140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
      145          150          155          160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
      165          170          175

Gln His Leu Gly Phe Trp Tyr Ile Leu Asp Pro Asn Ala Asp Gly Leu
      180          185          190

Tyr Gly Asn Phe Val Pro
      195

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&lt;210&gt; 6

&lt;211&gt; 198

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
protein construct

&lt;400&gt; 6

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Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
 1           5           10           15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
      20           25           30

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Asp	Ile	Asn	Gly	Asp	Gly	Lys	Ile	Thr	Leu	Asp	Glu	Ile	Val	Ser	Lys	
		35					40					45				
Ala	Ser	Asp	Asp	Ile	Cys	Ala	Lys	Leu	Gly	Ala	Thr	Pro	Glu	Gln	Thr	
		50					55					60				
Lys	Arg	His	Gln	Asp	Ala	Val	Glu	Ala	Phe	Phe	Lys	Lys	Ile	Gly	Met	
		65					70					75			80	
Asp	Phe	Gly	Lys	Glu	Val	Glu	Phe	Pro	Ala	Phe	Val	Asp	Gly	Trp	Lys	
		85					90					95				
Glu	Leu	Ala	Asn	Tyr	Asp	Leu	Lys	Leu	Trp	Ser	Gln	Asn	Asn	Lys	Ser	
		100					105					110				
Leu	Ile	Arg	Asp	Trp	Gly	Glu	Ala	Val	Phe	Asp	Ile	Leu	Asp	Lys	Asp	
		115					120					125				
Gly	Ser	Gly	Ser	Ile	Ser	Leu	Asp	Glu	Trp	Lys	Ala	Tyr	Gly	Arg	Ile	
		130					135					140				
Ser	Gly	Ile	Cys	Arg	Ser	Asp	Glu	Asp	Ala	Glu	Lys	Thr	Phe	Lys	His	
		145					150					155			160	
Cys	Asp	Leu	Asp	Asn	Ser	Gly	Lys	Leu	Asp	Val	Asp	Glu	Met	Thr	Arg	
		165					170					175				
Gln	His	Leu	Gly	Phe	Trp	Tyr	Thr	Leu	Asp	Pro	Asn	Ala	Asp	Gly	Leu	
		180					185					190				
Tyr	Gly	Asn	Phe	Val	Pro											
		195														

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<210> 7
<211> 198
<212> PRT
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Synthetic
      protein construct
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<400> 7
Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
  1             5             10             15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
      20             25             30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys
      35             40             45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr
      50             55             60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
      65             70             75             80

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Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
                     85                    90                    95  
 Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
                     100                    105                    110  
 Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp  
                     115                    120                    125  
 Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Cys Arg Ile  
                     130                    135                    140  
 Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
                     145                    150                    155                    160  
 Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
                     165                    170                    175  
 Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
                     180                    185                    190  
 Tyr Gly Asn Phe Val Pro  
                     195

<210> 8  
 <211> 198  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
           protein construct

<400> 8  
 Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
           1                    5                    10                    15  
 Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
                     20                    25                    30  
 Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
                     35                    40                    45  
 Ala Ser Asp Asp Val Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr  
                     50                    55                    60  
 Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met  
                     65                    70                    75                    80  
 Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys  
                     85                    90                    95  
 Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser  
                     100                    105                    110

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<210> 9
<211> 198
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
      protein construct
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<400> 9
Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
  1              5              10              15

Asp Asp Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
      20              25              30

Asp Ile Asn Gly Asp Gly Lys Val Thr Leu Asp Glu Ile Val Ser Lys
      35              40              45

Ala Ser Asp Asp Ile Cys Ala Arg Leu Gly Ala Thr Pro Glu Gln Thr
      50              55              60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
      65              70              75              80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys
      85              90              95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
      100              105              110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
      115              120              125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
      130              135              140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
      145              150              155              160

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Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
 165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
 180 185 190

Tyr Gly Asn Phe Val Pro  
 195

<210> 10

<211> 198

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
 protein construct

<400> 10

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe  
 1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu  
 20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys  
 35 40 45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Glu Ala Thr Pro Glu Gln Thr  
 50 55 60

Lys Arg His Gln Val Cys Val Glu Ala Phe Phe Arg Gly Cys Gly Met  
 65 70 75 80

Glu Tyr Gly Lys Glu Ile Ala Phe Pro Gln Phe Leu Asp Gly Trp Lys  
 85 90 95

Gln Leu Ala Thr Ser Glu Leu Lys Lys Trp Ala Arg Asn Glu Pro Thr  
 100 105 110

Leu Ile Arg Glu Trp Gly Asp Ala Val Phe Asp Ile Phe Asp Lys Asp  
 115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile  
 130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His  
 145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg  
 165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu  
 180 185 190

Tyr Gly Asn Phe Val Pro  
195

<210> 11  
<211> 600  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
nucleotide construct

<400> 11  
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tgggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaagatc 120  
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180  
cccagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240  
gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300  
taccacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360  
gtgttcgaca tcttcgacaa ggacggcagc ggctgcatca gcctggatga gtggaaggcc 420  
tacgcagaaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480  
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctggac 540  
ttctggtaca ccctggaccc caatgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 12  
<211> 600  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
nucleotide construct

<400> 12  
atggccgaca ccgcccagcaa gtacgccgtg aagctgaggc ccaacttcga caaccccaag 60  
tgggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaagatc 120  
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180  
cccagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240  
gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300  
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360  
gtgttcgaca tcttcgacaa ggacggcagc ggctgcatca gcctggatga gtggaaggcc 420  
tacgcagaaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480  
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540  
ttctggtaca ccctggaccc caatgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 13  
<211> 600  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
nucleotide construct

&lt;400&gt; 13

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atggccgaca cgcagcaaa gtacgccgtg aagctgaggc ccaacttcga caaccccaag 60
tgggtgaacc ggcacaagt catgttcaac ttcctggaca tcaacggcga cggcaagatc 120
accctggacg agatcgtgag cagggccagc gacgacatct gcgccaagct gggcgccacc 180
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240
gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420
tacggcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
ttctggtaca ccctggaccc caacgccgac ggctgtacg gcgacttcgt gccttgataa 600

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&lt;210&gt; 14

&lt;211&gt; 600

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
nucleotide construct

&lt;400&gt; 14

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atggccgaca cgcagcaaa gtacgccgtg aagctgaggc ccaacttcga caaccccaag 60
tgggtgaacc ggcacaagt catgttcaat ttcctggaca tcaacggcga cggcaagatc 120
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180
cccgagcaga ccaagagaca ccgggacgcc gtggaggcct tcttcaagaa gatcggcatg 240
gactacggca aggaggtgga gttccccgct ttcgtggacg gctggaagga gctggccaac 300
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360
gtgtttgaca tcttcgacaa ggacggcagc ggcagcatta gcctggatga gtggaaggcc 420
tacggtagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
ttctggtaca tcttggaccc caacgccgac ggctgtacg gcaacttcgt gccttgataa 600

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&lt;210&gt; 15

&lt;211&gt; 600

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
nucleotide construct

&lt;400&gt; 15

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atggccgaca cgcagcaaa gtacgccgtg aagctgaggc ccaacttcga caaccccaag 60
tgggtgaacc ggcacaagt catgttcaac ttcctggaca tcaacggcga cggcaagatc 120
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240
gacttcggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300
tacgacctga agctgtggag ccagaacaat aagagcctca tcagggactg gggcgaggcc 360
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420
tacggcagaa tcagcggcat ctgcagaagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
ttctggtaca ccctggaccc caacgccgac ggctgtacg gcaacttcgt gccttgataa 600

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<210> 16  
 <211> 600  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 nucleotide construct

<400> 16  
 atggccgaca ccgccagcaa gtacgccgtg aagctgaggc ccaacttcga caaccccaag 60  
 tgggtgaacc ggcacaagtt catgttcaac ttcctggaca tcaacggcga cggcaagatc 120  
 accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180  
 cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240  
 gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300  
 tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360  
 gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420  
 tactgcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480  
 tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540  
 ttctggtaca ccctggaccc caacgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 17  
 <211> 600  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 nucleotide construct

<400> 17  
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 accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180  
 cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240  
 gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300  
 tacgacctga agctgtggag ccaaaaacaag aagagcctca tcagggactg gggcgaggcc 360  
 gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggacga gtggaaggcc 420  
 tacggcagaa tcagcggcat ctgcagaagc gacgaggacg ccgaaaagac cttcaagcac 480  
 tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540  
 ttctggtaca ccctggaccc caacgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 18  
 <211> 600  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 nucleotide construct

<400> 18  
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 accctggacg agatcgtgag caaggccagc gacgacatct gcgccaaggct gggcgccacc 180  
 cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240

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gactacggca aagaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420
tacggcgaaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
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<210> 19

<211> 597

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
nucleotide construct ,

<400> 19

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atggccgaca ccgccagcaa gtacgccgtg aagctgcggc ccaacttcga caaccccaag 60
tgggtgaacc ggacacaagt catgttcaac ttcctggaca tcaacggcga cggcaagatc 120
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaaagt ggaggccacc 180
cccagcgaga ccaagcggca ccaagtgtgc gtggaggcct tcttccgcgg ctgcggcatg 240
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tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccgggca gcacctgggc 540
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<210> 20

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
primer

<400> 20

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gatgacgacg acaagatggc cgacaccgcc ag 32

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<210> 21

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

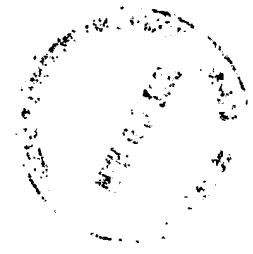
<223> Description of Artificial Sequence: Synthetic  
primer

<400> 21

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gaggagaagc ccggtttatc aaggacacga agt 33

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<210> 22  
 <211> 33  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 primer

<400> 22  
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33

<210> 23  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 primer

<400> 23  
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27

<210> 24  
 <211> 99  
 <212> DNA  
 <213> Homo sapiens

<400> 24  
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 gtgccgcgcg ccaagatcca ttggttgga tccgccacc 99